Dr. R James Duckworth

Professor Emeritus
Department of Electrical and Computer Engineering
Worcester Polytechnic Institute, 100 Institute Road,
Worcester MA 01609

Education

University of Nottingham, England.
Ph.D. in the Department of Electrical and Electronic Engineering (1984). Thesis title: "Parallel Computation on a Multi-Stream Data Flow Machine".
University of Bradford, England.
Four year thin sandwich degree course in Electrical and Electronic Engineering. Obtained 2:1 Hons BEng (1981).

Employment

Professor Emeritus, Electrical and Computer Engineering Department, Worcester Polytechnic Institute, July 2021- present
Associate Professor, Electrical and Computer Engineering Department, Worcester Polytechnic Institute, July 1991 – June 2021
Assistant Professor, Electrical Engineering Department, Worcester Polytechnic Institute, January 1987.
Lecturer, Computer Science Department, University of Nottingham, September 1984 to December 1986.
Engineer, Plessey Office Systems Ltd, Nottingham, August 1974 to August 1984.

Holds secret clearance

Teaching Experience

Prior to joining WPI in 1987 Dr. Duckworth was a lecturer in the Computer Science Department at the University of Nottingham in England. He developed and taught courses and laboratories in the areas of Digital Logic, Microprocessor Systems, and Computer Networks.

At WPI he has taught undergraduate and graduate courses in the electrical and computer engineering area. He has developed new course and laboratory material for many courses including:

- Advanced Logic Circuits
- Introduction to VLSI
- Microprocessor System Design
- Modeling and synthesis of digital system using Verilog and VHDL
- VHDL for Modeling and Synthesis

- Computer System Design
- Multi-processor and Distributed Systems
- Advanced Computer System Design
- Advanced Digital System Design using FPGAs

He also developed a textbook called “Workview Office Student Edition - schematic entry and digital analysis” which is published by Prentice Hall. This book has been used by many schools in their digital logic and circuit classes.

Dr. Duckworth has developed a short course titled “VHDL for Digital Design Synthesis”. He has taught this course many times to engineers at companies in Massachusetts.
He also developed and taught a new short course: “Practical Debugging of Systems under Test”.

Funded Grants and Awards Received

1. “Sensor fusion of inertial tracking with vision sensing”, Bosch Corporation, $62,085, December 2016
2. “Three-Dimensional Modeling to Support Indoor Location – Real-Time Image Capture Systems – Phase 3”, Astrium Services, $110,000, October 2014 (with Cyganski).
3. “Three-Dimensional Modeling to Support Indoor Location – Real-Time Image Capture Systems – Phase 2”, Astrium Services, $105,9121, September 2012 (with Cyganski).
4. “Precision Indoor Personnel Location and Tracking for Emergency Responders", DHS S&T, $20,000, September 2012 (with Cyganski).
5. “Improving Firefighter Health and Safety with Uninterrupted Real-Time Personal Sensors”, FEMA AFG FP&S, $998,124, August 2012 (with Cyganski and Notarianni).
6. “Development and Support of WPI August 2012 Workshop”, UCLA, $50,000, July 2012 (with Cyganski).
7. “Three-Dimensional Modeling to Support Indoor Location – Real-Time Image Capture Systems, Astrium Services, $109,410, August 2011 (with Cyganski).
8. “Development and Support of August 2011 Workshop- "Precision Indoor Personnel Location and Tracking for Emergency Responders", CSE, $50,000, September 2010 (with Cyganski)
9. Search and Rescue Prototype Systems (Mantenna), Honeywell, $118,081, September 2010 (with Cyganski)
10. Integration of WPI PPL and Honeywell Navigator Architecture: Phase I - Concept development and capability demonstration, Honeywell, $50,000, May 2010 (with Cyganski)
11. “Independent Analysis of Location Tracking Systems for First Responders via Focused Groups and Communities of Practice”, CSE, $135,000, January 2010 (with Cyganski).
12. “Fire-Ground Environment Sensor Monitoring”, FEMA AFG FP&S, $1,000,000, August 2009 (with Cyganski and Notarianni).

13. “Precision Personnel Location (PPL)”, CSE, $50,000, January 2009 (with Cyganski).
14. “Micro-Beacon Tracking of Autonomous Systems (MTAS)”, Honeywell, $401,984 (with Cyganski), October 2008.
15. “Testing and Evaluation of First Responder Indoor Location Technology”, NSRDEC, $433,879 (with Cyganski), September 2008.
16. “Microlight Indoor Positioning Performance Evaluation”, Raytheon, $100,000 (with Cyganski), June 2008.
17. “Real-Time Troop Physiological Status Monitoring Systems Using a Common Wireless Network”, USAMRMC, $1,007,985 (with Pedersen, Michalson, Mendelson & McGimpsey), April and June 2008.
18. “Integrated Firefighter Locator and Physiological Monitoring”, DHS FEMA, $999,303 (with Cyganski and Makarov), August 2007.
19. “Real-Time Troop Physiological Status Monitoring Systems Using a Common Wireless Network”, USAMRMC, $875,000 (with Pedersen, Michalson, Mendelson & McGimpsey), August 2007.
20. “Real-Time Troop Physiological Status Monitoring Systems Using a Common Wireless Network”, USAMRMC, $3,225,000 (with Pedersen, Michalson, Mendelson & McGimpsey), December 2005.
21. "Precision Indoor/Outdoor Personnel Location System III," from the Department of Justice, for $1,973,286 (with Orr, Makarov, Cyganski, and Michalson) October 2005.
22. "Development and Testing of Wireless Wearable Ultrasound Scanner," USAMRMC, $178,957. (with Pedersen) October 2005.
23. “Real-Time Troop Physiological Status Monitoring Systems Using a Common Wireless Network”, USAMRMC, $1,245,000 (with Pedersen, Michalson, Mendelson & McGimpsey), January 2005.
24. Donation of FPGA development boards and software from Xilinx, $20,000, various dates
25. “Industrial Wireless Sensors”, *Adaptive Instruments*, $20,000, September 2002.
26. Sponsored MQP, *Adaptive Instruments*, $5,000, May 2003.
27. Donation of Xilinx XACT software and FPGA development systems, $150,000, September 1996.
28. "Laboratory Equipment for Microkernel based Embedded Systems”, *NSF Instrumentation and Laboratory Improvement Grant*, $23,055 (with Michalson), March 1995.
29. “Microcontroller Based Tripping System”, Satin American Corp. and Protective Technologies, $45,000, November 1994
30. Donation of Viewlogic EDA software tools, *Viewlogic Systems, Inc*., $4.9 million, (with Michalson), 1993.
31. Donation of Altera EPLD development systems, *Altera Corp*, $170,000, January 1993.
32. "Developing New ECE Freshman Courses", *Educational Development Council*, $14,591 (with Eggimann), April 1992.
33. "Improving Autonomous Fault Detection and Isolation Using Neural Networks" *Federal Aviation Administration*, $45,211 (with Enge and Michalson)

34. "Introducing Parallel Processing Concepts using Transputer Systems", *NSF Instrumentation and Laboratory Improvement Grant*, $74,746 (with Rotithor), March 1992.
35. "Shell for Knowledge Representations into Ada with Maintenance", *Real Time Intelligent Systems Company*, $18,000, September 1991.
36. Donation of Stratus Fault Tolerant System 30 and associated software, *Stratus Corporation*, $103,000 (with John Orr), October 1991.
37. "Knowledge Representation into Ada Methodology with Validation and Verification [KRAM 2-2]", *NASA and Air Force*, $143,400 (with Becker), Jan 1991.
38. "Design of a 16-bit ISA Bus Interface Card", *Robec Distributors*, $26,066, June 1990.
39. "Knowledge Representation into Ada Methodology with Validation and Verification [KRAM 2-1]", *NASA and Air Force*, $96,000 (with Becker), April 1990.
40. "Review and Design of the Bus Interface Card", *Robec Distributors*, $24,906, October 1989.
41. "Satin Distinguished Fellow Award", $18,000, April 1989.
42. "Review and Design of the Bus Interface Card", *Robec Distributors*, $18,000, January 1989.
43. "Validation and Verification of Expert Systems", *NASA and Air Force*, $171,000 (with Becker and Green), January 1989.
44. "Transputer Development System", *Inmos Corporation*, $11,000, donation of equipment and software, August 1988.
45. Donation from the *Raytheon Company* for $21,000 to support MQPs and research in the Intelligent Machines Laboratory (with Peter Green), January 1988.
46. "Evidence Based Scheduling for Real-Time Distributed Computer Systems", (with Green), *National Science Foundation*, $30,000, November 1, 1987.
47. "Developing an Activation Framework for a Parallel Computer". *Research Development Council*, Worcester Polytechnic Institute, $4,437, November 1987.

Publications and Presentations

1. “Detection and Resolution of Motion Conflict in Visual Inertial Odometry”. ICRA 2018: (with Babu, Cyganski, Kim) 2018
2. “Transactional Array Reconciliation Tomography for Precision Indoor Location”. IEEE Trans. Aerospace and Electronic Systems 50(1): 17-32 (2014) (with Amendolare, Cyganski) 2014
3. “Gyroscope assisted scalable visual simultaneous localization and mapping” In Proc. of UPINLBS 2014 (with Babu, Cyganski) 2014
4. "Transactional Array Reconciliation Tomography for Precision Indoor Location" IEEE Transactions on Aerospace and Electronic Systems (with Amendolare and Cyganski) – January 2014.
5. "Indoor navigation for first responders" by Duckworth and Cyganski, AccessScience, McGraw-Hill Education, LLC, 2013.
6. "Tutorial – Urban Indoor Navigation", Institute of Navigation, Joint Navigation Conference 2013, Colorado Springs, Colorado, June 2013.

7. "Precision Personnel Locator: Inverse Synthetic Aperture Array Reconciliation Tomography" by Cavanaugh, Lowe, Cyganski, and Duckworth, ION/IEEE Position Location and Navigation Symposium (PLANS) 2012, Myrtle Beach, SC, June 2012.
8. "Tutorial - Urban and Indoor Navigation", ION GNSS, Portland, Oregon, September 2011.
9. "Location and Tracking for First Responders", invited Plenary Session speaker, TCIP 2011 (Technologies for Critical Incident Preparedness) National Harbor, Maryland, August 2011.
10. "Integrated First Responder Location and Physiological Monitoring", invited speaker, Body Area Network Technology and Applications, Worcester, MA, June 2011
11. "Tutorial – Urban Indoor Navigation", Institute of Navigation, Joint Navigation Conference 2011, Colorado Springs, Colorado, June 2011.
12. "WPI Precision Personnel Locator System - Inertial Filtering for Improved Positioning Accuracy in Challenging RF Environments" by Lowe, Cavanaugh, Cyganski, Duckworth, Joint Navigation Conference 2011, Colorado Springs, Colorado, June 2011.
13. "A New Bidirectional Transaction Approach to Improve Precision Location in Indoor Environments", by Cavanaugh, Lowe, Cyganski, and Duckworth, *Institute of Navigation, International Technical Meeting*, San Diego, California, January 2011.
14. "Indoor Location and Tracking Systems for First Responders", Invited speaker at *Institute of Navigation, New England Section*, Boston, MA, October 2010
15. "Fireground Environment Sensor Monitor System", by Duckworth, Cyganski, Notarianni, *Annual AFG R&D Meeting*, Chicago, Illinois, August 2010
16. "PPL System", by Duckworth, Cyganski, *Interflam 2010*, Nottingham, England, July 2010
17. "Tutorial – Urban Indoor Navigation" by Duckworth. *Institute of Navigation, Joint Navigation Conference 2010*, Orlando, Florida, California, June 2010.
18. "WPI Precision Personnel Location System: New RF Location Algorithms for Improved Precision Location in High Multipath Indoor Environments" by Amendolare, Cyganski, Duckworth, *Joint Navigation Conference*, Orlando, Florida, June 2010.
19. "Location and Tracking for First Responders", invited Plenary Session speaker, *Institute of Navigation, International Technical Meeting*, San Diego, CA, January 2010.
20. "WPI Precision Personnel Locator System – Rapid Deployment Antenna System and Supporting Algorithms for 3D Precision Location", by Cavanaugh, Lowe, Cyganski, and Duckworth, *Institute of Navigation, International Technical Meeting*, San Diego California, January 2010.
21. "Micro-Beacon Tracking of Autonomous Systems (MTAS)" by Cyganski, Duckworth, Baughman. *Institute of Navigation, GNC Challenges for Miniature Autonomous Systems Workshop*, Fort Walton Beach, Florida, October 2009.
22. "Tutorial – Urban Indoor Navigation" by Duckworth. *Institute of Navigation, Joint Navigation Conference 2009*, Orlando, Florida, California, June 2009.
23. "WPI Precision Personnel Location System: Synchronization of Wireless Transceiver Units" by Amendolare, Cyganski, Duckworth, *Joint Navigation Conference*, Orlando, Florida, June 2009.

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.